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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,084	11/20/2003	JINN-KONG SHEU	10722-US-PA	1083

31561 7590 11/19/2007

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER	
ERDEM, FAZLI	
ART UNIT	**PAPER NUMBER**
2826	

NOTIFICATION DATE	DELIVERY MODE
11/19/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USA@JCIPGROUP.COM.TW

Office Action Summary	Application No.	Applicant(s)	
	10/707,084	SHEU ET AL.	
	Examiner	Art Unit	
	Fazli Erdem	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-11,14-17,19 and 21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-11,14-17,19 and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 August 2007* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The replacement drawings filed 8/9/2007 are still objected to because the examiner cannot ascertain where the "first protrusion portion" and the "second protrusion portion" are in the figures. From the figures, it looks like the "first protrusion portion" is just the first layer and the second combined of the two layer structure and the "second protrusion portion" is the first layer only.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-5 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Yanamoto (2003/0047744)

Regarding Claim 1, Yanamoto discloses a light emitting device where in Figs. 8 and 10 it is disclosed a substrate 101; a GaN-based semiconductor layer, disposed on the substrate, wherein the GaN-based semiconductor layer comprises a first protrusion portion, wherein the GaN-based semiconductor layer comprising: a nucleation layer/buffer layer 102, disposed on the substrate 101; an ohmic contact layer 103, disposed on the nucleation layer 102, wherein the ohmic contact layer comprises a second protrusion portion; an active layer 107, disposed on the second protrusion portion, wherein the first protrusion portion is constructed by the second protrusion portion of the ohmic contact layer and the active layer; a high-resistivity GaN-based interlayer/current strangulation layer 204 for reducing leakage current (for a discussion of how current strangulation layer reduces leakage current please see Yanamoto's related paten application 2003/0047744 included in the 892 Form. Specifically, paragraph 0047

discloses the leakage current reduction), disposed on the first protrusion portion of the GaN-based semiconductor layer, and a material of the GaN-based interlayer comprising AlInGaN (paragraph 0047) a first electrode 120, disposed on the GaN-based interlayer/current strangulation layer; and a second electrode 121 disposed on a portion of the GaN-based semiconductor layer except for the first protrusion portion

Regarding Claim 2, first bond-pad (not shown in Fig.) is located on first electrode 120.

Regarding Claim 3, second bon-pad (not shown in Fig) is located on second electrode 121.

Regarding Claim 4, substrate is sapphire (paragraphs 0004 and 0049)

Regarding Claim 5, interlayer/current strangulation layer 204 is ion implanted with n-type impurity a shown in paragraph 0047

Regarding Claim 10, the electrodes are formed of Ti/Al as shown in paragraph 0086.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 7-9 rejected under 35 U.S.C. 103(a) as being unpatentable over Yanamoto (2003/0047744) as applied to claim 1 above, further in view of D'Evelyn et al. (2004/0124435).

Regarding Claims 7-9, Yanamoto discloses a light emitting device where in Figs. 8 and 10 it is disclosed a substrate 101; a GaN-based semiconductor layer, disposed on the substrate, wherein the GaN-based semiconductor layer comprises a first protrusion portion, wherein the GaN-based semiconductor layer comprising: a nucleation layer/buffer layer 102, disposed on the substrate 101; an ohmic contact layer 103, disposed on the nucleation layer 102, wherein the ohmic contact layer comprises a second protrusion portion; an active layer 107, disposed on the second protrusion portion, wherein the first protrusion portion is constructed by the second protrusion portion of the ohmic contact layer and the active layer; a high-resistivity GaN-based interlayer/current strangulation layer 204 for reducing leakage current, (for a discussion of how current strangulation layer reduces leakage current please see Yanamoto's related paten application 2003/0047744 included in the 892 Form. Specifically, paragraph 0047 discloses the leakage current reduction), disposed on the first protrusion portion of the GaN-based semiconductor layer, and a material of the GaN-based interlayer comprising AlInGaN (paragraph 0047) a first electrode 120, disposed on the GaN-based interlayer/current strangulation layer; and a second electrode 121 disposed on a portion of the GaN-based semiconductor layer except for the first protrusion portion. Yanamoto fails to disclose the required type of active/semiconductor, nucleation/buffer and contact/clad/cladding layer of AlInGN type. However, D'Evelyn et al. disclose a gallium nitride based electronic devices where in paragraphs 0026, 0048 and 0055, AlInGaN based semiconductor/active, nucleation/buffer and contact/clad layers are disclosed.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required active, nucleation, contact layers in Yanamoto as taught by D'Evelyn et al. in order to have a ease of manufacture since the current strangulation layer/high resisvitiy layer of Yanamoto is also AlInGaN based layer.

Regarding Claim 7, nucleation layer/buffer layer is disclosed in paragraph 0048 of D'Evelyn et al.

Regarding Claim 8, contact/clad layer is disclosed in paragraph 0055 of D'Evelyn et al.

Regarding Claim 9, semiconductor/active layer is disclosed in paragraph 0026 of D'Evelyn et al.

5. Claims 11, 14-17, 19 and 21 rejected under 35 U.S.C. 103(a) as being unpatentable over Yanamoto (2003/0047744) in view of D'Evelyn et al. (2004/0124435) further in view of D'Evelyn et al. (2002/0155634)

Regarding Claim 11, Yanamoto discloses a light emitting device where in Figs. 8 and 10 it is disclosed a substrate 101; a GaN-based semiconductor layer, disposed on the substrate, wherein the GaN-based semiconductor layer comprises a first protrusion portion, wherein the GaN-based semiconductor layer comprising: a nucleation layer/buffer layer 102, disposed on the substrate 101; an ohmic contact layer 103, disposed on the nucleation layer 102, wherein the ohmic contact layer comprises a second protrusion portion; an active layer 107, disposed on the second protrusion portion,

wherein the first protrusion portion is constructed by the second protrusion portion of the ohmic contact layer and the active layer; a high-resistivity GaN-based interlayer 204, disposed on the first protrusion portion of the GaN-based semiconductor layer, and a material of the GaN-based interlayer comprising AlInGaN (paragraph 0047) a first electrode 120, disposed on the GaN-based interlayer/current strangulation layer 204 for reducing leakage current (for a discussion of how current strangulation layer reduces leakage current please see Yanamoto's related paten application 2003/0047744 included in the 892 Form. Specifically, paragraph 0047 discloses the leakage current reduction), and a second electrode 121 disposed on a portion of the GaN-based semiconductor layer except for the first protrusion portion. D'Evelyn et al. '435 disclose a gallium nitride based electronic devices where in paragraphs 0026, 0048 and 0055, AlInGaN based semiconductor/active, nucleation/buffer and contact/clad layers are disclosed. Yanamoto and D'Evelyn et al. '435 fail to disclose the required interlaced electrode structure. However, De'Evelyn et al. '634 disclose a photodetector device where in Fig. 2 interlaced finger shaped electrodes are disclosed

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required interlaced fingershaped electrodes in Yanamoto and D'Evelyn et al. '435 combination as taught by D'Evelyn et al. '635 in order to have a semiconductor device with compact size since interlaced finger shaped electrodes provide an optimum electrode configuration without taking space.

Regarding Claim 14, in Yanamoto, first bond-pad (not shown in Fig.) is located on first electrode 120.

Regarding Claim 15, in Yanamoto, second bond-pad (not shown in Fig) is located on second electrode 121.

Regarding Claim 16, in Yanamoto, substrate is sapphire (paragraphs 0004 and 0049)

Regarding Claim 17, in Yanamoto, interlayer/current strangulation layer 204 is ion implanted with n-type impurity a shown in paragraph 0047.

Regarding Claim 19, Regarding Claim 7, nucleation layer/buffer layer is disclosed in paragraph 0048 of D'Evelyn et al. ('435)

Regarding Claim 21, the electrodes are formed of Ti/Al as shown in paragraph 0086 of Yanamoto.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fazli Erdem whose telephone number is (571) 272-1914. The examiner can normally be reached on M - F 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

FE
November 13, 2007

SUE A. PURVIS
SUPERVISORY PATENT EXAMINER